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Standard #55
Clinical Laboratory Results
Version 2.0

Standard *#55 Clinical Laboratory Results* is compatible with all HL7 version 2.2 message standards.

Purpose
The *Clinical Laboratory Results Standard* is an implementation guide providing the message framework of HL7 version 2.2 laboratory result messages for laboratory messages exchanged in the state of Utah.

The details of HL7 version 2.2 laboratory result message can be found in Appendices A, B, C, D , E and F

This Clinical Laboratory Results Standard is used to exchange laboratory results electronically (See Appendix D – Additional Requirements when sending the State of Utah Reportable Laboratory Results)

This Standard closely aligns where possible, a national effort to standardize laboratory results (ELINCS[1]).

Applicability

This standard is applicable to Health Care providers, Laboratories and Third Party Payers as defined by Utah Code Annotated R380-70.

Basic Concepts

- A Sender will create an HL7 version 2.2 laboratory result message.
- The Sender will send the HL7 version 2.2 laboratory result message to the identified Receiver.
- The Receiver will follow the HL7 #54 Acknowledgement and Error Status Specification to send the applicable acknowledgment and/or error status response to the Sender who submitted the HL7 version 2.2 laboratory result message.

Detail

This structure provides an overview of the segment usage (e.g. repetitions, optional) used in this Standard

Braces { } = Indicate one or more repetitions of the enclosed group of segments
Brackets [ ] = Show that the enclosed group of segments is optional.
* = Conditional

ORU	Observational Results (Unsolicited)	HL7 Standard Chapter
MSH	Message Header	2
{		
PID	Patient Identification	3
[{NTE}]	Notes and comments	2

[1] EHR- Laboratory Interoperability and Connectivity Specification (www.elincs.org).

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```
    {
     ORC        Order common                4
      OBR       Observations Report ID      7
     {[NTE]}    Notes and comments          2
       {
        OBX     Observation/Result          7
         {[NTE]} Notes and comments         2
       }
     }
}
[ZUH] *conditional
```

*ZUH – This segment is required when sending cytology, histology and microbiology (e.g. cultures and antimicrobial sensitivities) laboratory results.

Laboratory results, including but not limited to state reportable laboratory results, are currently submitted and accepted using a variety of methods (e.g. fax, mail, proprietary specific systems, etc) and formats. This document standardizes HL7 formatted laboratory result for use in an electronic exchange of laboratory results between entities in the State of Utah.

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Implementation Issues

- **General:**
  - UHIN trading partners will follow the UHIN standard connection documents (SOAP over HTTPS) when exchanging laboratory results via the UHIN gateway. Trading partners not exchanging through UHIN will need to negotiate the connectivity requirements.
  - Senders/Receivers must have an HL7 translator or use a third-party software tool (e.g. UHINT) to create and/or receive HL7 version 2.2 laboratory result messages.
- Senders:
  - A sender will need to communicate their desire to exchange an intended HL7 version 2.2 laboratory result message to the receiver, prior to the exchange of data
- Receivers:
  - A receiver must be able to receive the intended HL7 version 2.2 laboratory result message from the sender.

Implementation Date

- The implementation date of this Standard is September 2009.

History: (MM/DD/YY)

	Original	A* 1	A 2	A3	A 4	A 5	A 6
ORIGINATION DATE	08/04/05	12/13/06	06/12/08				
APPROVAL DATE	06/07/06	08/01/07	08/03/08				
EFFECTIVE DATE	07/10/06	09/01/07	09/30/09				

* A = Amendment

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Standard #55 Clinical Laboratory Results v2.0 Contents

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Appendix A – Basic Definitions

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Basic Definitions

- **Data Type (DT)** – The basic building block used to construct or restrict the contents of a data field.
  - CE – Coded element, replaced CNE and CWE as of v2.3.1.
  - CK – Composite ID with check digit
  - CM – Composite
  - CN – Composite ID number and name, withdrawn v2.3
  - DT – Date, Date/time
  - FN – Family name
  - FT – Formatted text
  - HD – Hierarchic designator, used in version 2.5 (SEQ 3, 4, 5 and 6).
  - ID – Coded values for HL7 tables
  - IS – Coded value for user-defined table.
  - PN – person name
  - SI – Sequence ID
  - ST – String, alphanumeric.
  - TQ – Timing/quantity
  - TS – Times stamp, date/time.
- **Discrete (structured) Report Format –** Observations/tests are reported in individual OBX segment.
- **Element/Field** – A string of characters, see SEQ.
- **Free-Text Report Format –** Observations/tests are reported in single OBX segment. Please See Appendix E and F for examples as it relates to Cytology, Pathology and Microbiology.
- **Health Level 7 (HL7[2]) –** HL7 is a Standards Development Organization (SDO) and focuses on the interface requirements between healthcare information systems.
- **Maximum Length (LEN**) – Maximum number of characters that one occurrence of the data field may occupy.
- **Optionality (OPT)** – Whether the field is required, optional, or conditional in a segment.
  - **R** – Required
  - **O** – Optional
  - **C** – Conditional
- **Position (Sequence within the segment, SEQ)** – See SEQ.
- **Repetition (RP#) –** Whether the field may repeat.
  - **N or blank –** No repetition
  - **Y –** The field may repeat an indefinite or site-determined number of times.
  - **(integer) –** The field may repeat up to the number of times specified by the integer.
- **Segment –** A logical grouping of fields (e.g. MSH, ORC, OBR, OBX, NTE).
- **SEQ**– Ordinal position of the data field within the segment. This number is used to refer to the data field in the text comments that follow the segment definition table.
- **Table (TBL#) –** The table attribute of the data field definition specifies the HL7 identifier for a set of coded values.

[2] HL7 refers to the application level of the ISO/OSI model http://www.hl7.org/

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- **Delimiter values**

Delimiter	Suggested Value	Encoding Character Position	Usage
Segment Terminator	<CR>	-	Terminates a segment record. This value cannot be changed by implementers
Field Separator	|	-	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment
Component Separator	^	1	Separates adjacent components of data fields where allowed
Subcomponent Separator	&	4	Separates adjacent subcomponents of data fields where allowed. If there are no subcomponents, this character may be omitted.
Repetition Separator	~	2	Separates multiple occurrences of a field where allowed
Escape Character	\	3	Escape character for use with any field represented by an ST, TX or FT data type, or for use with the data (fourth) component of the ED data type. If no escape characters are used in a message, this character may be omitted. However, it must be present if subcomponents are used in the message.

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Appendix B – HL7 Attribute Table

These tables list and describe the data fields in the segment and characteristics of their usage.

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Table 1 - HL7– MSH – Message Header

(Please reference HL7 Header and Trailer Specification #53)

For column table heading definitions, see Appendix A – Basic Definitions

Example MSH Segment-
MSH| ^~\&| |9999^| |1111^|20060126130405| |**ORU^R01**
|20060126130405|P|**2.2**| | |ER

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element	Comments
9	13	CM	R	[1..1]		00009	Message Type	Composite
9.1		ID	R				Message Type	Use “ORU”
9.2		ID	R				Trigger Event	Use “R01”
12	8	ID	R R	[1..1]		00012	Version ID	Composite
12.1		ID	R				Version ID	Use “2.2”

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Table 2 - HL7 – PID - Patient Identification Segment

For column table heading definitions, see Appendix A – Basic Definitions

Example 1 (Provider (laboratory/hospital)-to-provider laboratory result):
PID|1| |123456^^^ABC Clinic&^MR^| |SMITH^JOHN^^JR| |19650201|M| | | | | | | | | | | | | | | | | | | | |

Example 2 (Provider-to-Payer solicited attachment):
PID|1| |123456^^^ABC Clinic^MR^~4652^^^ABC Clinic^ACN^|65265255^^^Payer 123 ^SN~6256^^^Payer 123 ^ICN|SMITH^JOHN^^JR| |19650201|M| | | | | | | | | | | | | | | | | | | | |

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
1	4	SI	R	[0..1]		00104	Set ID – PID	This states the number of PID records
2	16	CK	O			00105	Patient ID (external ID)	
3	20	CM	R	[1..*]		00106	Patient ID (Internal ID)	Composite This includes the provider patient identification number and/or the attachment control number (see 3.5).
3.1		ST	R				ID Number	The ID number for the 3.5 qualifier.
3.2			N/A					
3.3			N/A					
3.4			R				Assigning Authority	Refers to the source organization or enterprise
3.4.1			R				Namespace ID	Identifier to be defined by trading partner
3.4.2			O				Universal ID	
3.4.3			O				Universal ID Type	

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
3.5			R				Identifier Type Code	Provider patient identification number(s) values are limited to at least one identifier are required. **"MR"** - Medical Record Number. **"NI"** - National unique individual identifier **"NNxxx"** – National person identifier **"PI"** – Patient internal identifier **"PN"** – Person number; **OR** **"PT"** - Patient external identifier". **If used as a "Unsolicited Claim Attachment"**, the Claim Attachment Identifier Type is also required. *The following value is also required if sending this message as a unsolicited attachment to a payer:* **"ACN"** – Attachment Control Number (The PWK06 in the X12 837 or 278 transaction).
3.6			R				Assigning facility	Refers to the facility within the organization or enterprise (only needed if ID is facility specific).
3.6.1			R				Namespace ID	Identifier to be defined by trading partner
3.6.2			O				Universal ID	
3.6.3			O				Universal ID Type	

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
4			C	[1..*]		00107	Alternative Patient ID – PID	Required if sending this message as an attachment to a payer. This includes the payer patient identification number and/or the payer transaction number (see 4.5).
4.1		ST	R				ID Number	The ID number for the 4.5 qualifier.
4.2			N/A					
4.3			N/A					
4.4			C				Assigning Authority	Payer Organization Name Required if data is present in PID-4.1
4.4.1			C				Namespace ID	Identifier to be defined by trading partner Required if data is present in PID-4.1
4.4.2			O				Universal ID	
4.4.3			O				Universal ID Type	

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
4.5			C				Identifier Type Code	***Claim Attachment Patient Identifier Type:*** *The following value is required in this field if sending this message as an attachment to a payer.* *At least one of the following payer patient identifier values are required:* **"SN"** (Subscriber number); **"MA"** (Patient Medicaid number) or **"MC"** (Patient Medicare number) ***Solicited Attachment Identifier Type:*** *The following value is* also *required in this field, if sending this message as a solicited attachment to a payer based on a request from the payer (e.g. for* ***solicited claims*** *OR* ***solicited prior authorizations)***: **"ICN"** – Payer Control Number (The TRN02 in the X12 277 or 278 transaction). Required if data is present in PID-4.1
5	48	PN	R	[0..1]		00108	Patient Name	Composite It is recommended that the patient name follow UHIN Standard #37
5.1		FN	R				Family Name	Required that something is placed in this field even with anonymous patients
5.2		ST	O				Given Name	Recommend use, if available

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
5.3		ST	O				Second and further given names or initials thereof	Recommend use, if available
5.4		ST	O				Suffix	Recommend use, if available
5.5		ST	O				Prefix	
5.6		ST	O				Degree	
5.7		ID	O				Name Type Code	
6	30	PN	O			00109	Mothers Maiden Name	
7	26	TS	O	[0..1]		00110	Date/Time of Birth	Composite.
7.1		TS	O				YYYYMMDD	Recommend use, if available
8	1	IS	O	[0..1]	0001	000111	Sex	Recommend use, if available See table 11
9 thru 38								Not used at this time for the Laboratory Result Message

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Table 3 - HL7 – ORC – Order Common

For column table heading definitions, see Appendix A – Basic Definitions

Example:
ORC|RE|Q55555555^9999^|0506DE188424^9999^| |CM| | | |200406070000| | |NPI NUMBER^SMITH^JOHN^^^^^NPI| | | | | |

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element	Comments
1	2	ID	O		0119	00215	Order Control	Recommend use, if available. See table 20
2	75	CM	C			00216	Placer Order Number	Composite If sent in the order this is required in the results **Note:** This is the same value which can also be placed in OBR-2
2.1		ST	R				Entity Identifier	Identifier to be defined by trading partners
2.2		IS	O				Namespace ID	Identifier to be defined by trading partners
2.3		ST	O				Universal ID	
2.4		ST	O				Universal ID Type	
3	75	CM	R			00217	Filler Order Number	Composite **Note:** This is the same value which can also be placed in OBR-3
3.1		ST	R				Entity Identifier	Identifier to be defined by trading partners
3.2		IS	O				Namespace ID	Identifier to be defined by trading partners
3.3		ST	O				Universal ID	
3.4		ID	O				Universal ID Type	
4						00218	Placer Group Number	Not used at this time for the Laboratory Result Message

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element	Comments
5	2	ID	O		0038	00219	Order Status	See table 12
6						00220	Response Flag	Not used at this time for the Laboratory Result Message
7						00221	Quantity/Timing	Not used at this time for the Laboratory Result Message
8						00222	Parent	Not used at this time for the Laboratory Result Message
9	26	TS	O			00223	Date and Time Of transaction	
10						00224	Entered By	Not used at this time for the Laboratory Result Message
11						00225	Verified By	Not used at this time for the Laboratory Result Message
12	80	CN	R	Y		00226	Ordering Provider	Composite This is the same value which could also be placed in OBR-16
12.1		ST	R				ID Number	The ID number for the 12.8 qualifier. **Note:** The ID number is the NPI
12.2		FN	R				Family Name	
12.3		ST	R				Given Name	
12.4		ST	O				Second and Further Given Names or Initials Thereof	
12.5		ST	O				Suffix	Example: “JR”, “III”
12.6		ST	O				Prefix	Example: “Dr”, “Mr”
12.7		ST	O				Degree	Example: “M.D.”

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element	Comments
12.8		IS	R				Identifier Type Code	Values are limited: **"NPI"** (National Provider Identifier) **NOTE:** The ID number is the NPI
13 thru 19								Not used at this time for the Laboratory Result Message

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Table 4 - HL7 – OBR – Observation Request

For column table heading definitions, see Appendix A – Basic Definitions

Example - General Laboratory Result
OBR|1|Q55555555^9999^|0506DE188424^9999^|1600^TSH^L^11580-8^TSH, SERUM^LN| | |
200406070000| | | | | |200406070900| | | | | | |200406080900| | |F| | | | | | | | | | |

For specific cytology and pathology (surgical pathology) guidance and example(s) see Appendix E.

For microbiology specific guidance and example(s) see Appendix F.

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
1	4	SI	R	[0..1]		00237	Set ID –	OBR sequence number
2	75	CM	C	[1..1]		00216	Place Order Number	Composite **Note:** This field contains the same value which should be placed in ORC-2
2.1		ST	R				Entity Identifier	Identifier to be defined by trading partners
2.2		IS	O				Namespace ID	Identifier to be defined by trading partners
2.3		ST	O				Universal ID	
2.4		ST	O				Universal ID Type	
3	9	EI	R	[1..1]		00217	Filler Order Number	Composite **Note:** This field contains the same value which should be placed in ORC-3
3.1		ST	R				Entity Identifier	Identifier to be defined by trading partners
3.2		IS	O				Namespace ID	Identifier to be defined by trading partners
3.3		ST	O				Universal ID	
3.4		ID	O				Universal ID Type	
4	200	CE	R	[1..1]		00238	Universal Service Identifier	Composite

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
4.1		ST	O				Identifier	Recommend use, if available. Agreed upon by trading partners Example: “1600”
4.2		ST	R				Text	Agreed upon by trading partners Example: “TSH”
4.3		IS	R		0396		Name of Coding System	Recommend use, if available. See table 23. Agreed upon by trading partners Use L= local for local field
4.4		ST	C				Alternate Identifier	Recommend use of LOINC Identifiers, if available see appendix C for guidance. Required field ,see appendix D
4.5		ST	C				Alternate Text	Recommend use of LOINC Identifiers, if available see appendix C for guidance. Required field ,see appendix D
4.6		IS	C		0396		Name of Alternate Coding System	Recommend use, If available. See table 23. Alternative coding system LOINC, use “LN”
5 thru 6								Not used at this time for the Laboratory Result Message
7	26	TS	C	[1..1]		00241	Observation Date/Time	Composite

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
7.1		TS	C				YYYYMMDD[HH[MM[(SS)]+/-ZZZZ]	When the sample is collected or obtained **Note:** If the observation date/time is received in the order it must be displayed in the result
8	26	TS	C	[0..1]		00242	Observation End Date/Time	Composite
8.1		TS	C				YYYYMMDD[HH[MM[(SS)]+/-ZZZZ]	May be used for timed specimen collection **Note:** If the observation end date/time is received in the order it must be displayed in the result
9 thru 10								Not used at this time for the Laboratory Result Message
11	1	ID	C	[1..1]	0065	00245	Specimen Action Code	See table 13 **Note:** Intended to flag add-on tests and reflex tests Specific use guidance A, G, L and O Affect OBR-2 and OBR-29
12							Danger Code	Not used at this time for the Laboratory Result Message

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
13	300	ST	C				Relevant Clinical information	Additional clinical information about the patient or specimen will be provided here or conditions that influence test interpretations (i.e. Fasting, LMP date, etc) **Note:** If relevant clinical information is received in the order it must be displayed in the result
14	26	TS	O			00248	Specimen Received Date/Time	Composite
14.1		TS	O				YYYYMMDD[HH[MM[(SS)]+/-ZZZZ]	Recommend use, if available
15	300	CM	C	[0..1]		00249	Specimen Source	Composite **Note:** If the observation specimen source is received in the order it must be displayed in the result
15.1		CE	R		0070		Specimen Source Name or Code	See table 14
15.2		ST	O				Identifier	Recommend use, if available
15.3		ST	R				Text	
15.4		IS	C				Name of Coding System	**Note:** If a coding system is used this data element is required.
16	60	CN	O	[1..1]		00226	Ordering Provider	Composite

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
16.1		ST	O				ID Number	This subfield contains the same value which should be placed in ORC-12.1
16.2		FN	O				Family Name	This subfield contains the same value which should be placed in ORC-12.2
16.3		ST	O				Given Name	This subfield contains the same value which should be placed in ORC-12.3
16.4		ST	O				Second and Further Given Names or Initials Thereof	This subfield contains the same value which should be placed in ORC-12.4
16.5		ST	O				Suffix	e.g. JR or III, etc. This subfield contains the same value which should be placed in ORC-12.5
16.6		ST	O				Prefix	e.g. Dr, etc This subfield contains the same value which should be placed in ORC-12.6
16.7		ST	O				Degree	e.g. M.D. This subfield contains the same value which should be placed in ORC-12.7
16.8		IS	R				Identifier Type Code	This subfield contains the same value which should be placed in ORC-12.8
17 thru 19								Not used at this time for the Laboratory Result Message

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
20						00253	Filler Field 1	Not used at this time for the Laboratory Result Message
21						00254	Filler Field 2	Not used at this time for the Laboratory Result Message
22	26	TS	R	[0..1]		00255	Results Rpt/Status Chng – Date/Time	Composite
22.1		TS	R				YYYYMMDD[HH[MM[(SS)]+/-ZZZZ]	
23							Charge to Practice	Not used at this time for the Laboratory Result Message
24	10	ID	O		0074	00257	Diagnostic Serv Sect ID	See table 15
25	1	ID	R	[1..1]	0123	00258	Result Status	See table 21
26	200	CM	C	[0..1]		00259	Parent Result	**Note:** Required if a reflex test is performed. See appendix F for microbiology only
27	200	TQ	C			00221	Quantity/Timing	All components are optional 27.6 is the recommend use for priority (i.e. STAT, ASAP, etc)
27.1			O				Quantity	
27.2			O				Interval	
27.3			O				Duration	
27.4			O				Start Date/Time	
27.5			O				End Date/Time	
27.6			C				Priority	**Note:** If priority is given on the requisition order it must be included in the result. (i.e. STAT, ASAP, etc)

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
28							Result Copies to	Not used at this time for the Laboratory Result Message
29	150	CM	C	[0..1]		00261	Parent	**Note:** Required if a reflex test is performed. See appendix F for microbiology only
30 thru 36								Not used at this time for the Laboratory Result Message

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Table 5 - HL7 – NTE – Notes and Comments Segment

For column table heading definitions, see Appendix A – Basic HL7 Definitions

Example:
NTE|1|L|Physician office|

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
1	4	SI	O	[0..1]		00096	Set ID –	Recommend use, if available NTE sequence number NTE Can follow PID, ORC, OBR and OBX segments
2	8	ID	O		0105	00097	Source of Comment	Recommend use, if available. See table 19.
3	65536	FT	O	[0..*]		00098	Comment	Recommend use, if available

Note: Although the NTE field is a flexible way to attach any text-based message to a lab result report, it is important that the NTE segment not be used to report the test result itself. For example, the NTE segment has sometimes been used to report "text-based" test results, such as the results of Pap smears or microbiology cultures. This use of the NTE segment is not in conformance with this *Standard*. Furthermore, it is not necessary to report text-based test results in this way. Note that the OBX segment *(OBX-5)* can accommodate any text-based reporting, since the Observation Value field *(OBX-5)* can contain text strings up to 65,000 characters long. The Comment field in the NTE segment should be reserved for meta results only, such as the reason that a test could not be completed or information regarding the methodology of a test or the limitations of its interpretation[3].

[3] The "note" comment was taken from version 3.0 of the ELINCS[3] documentation. Modifications to this comment is in *italics.* EHR- Laboratory Interoperability and Connectivity Specification (www.elincs.org)

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Table 6 - HL7 – OBX – Observation/Result Segment

For column table heading definitions, see Appendix A – Basic Definitions

Example 1 (General Laboratory Result):
OBX|1|NM|1600^TSH^L^11580-8^TSH, SERUM^LN| |6.2|MU/L| 0.45 – 5.5|H| | |N| | | |SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |

For specific cytology and pathology (surgical pathology) guidance and example(s) see Appendix E.

For microbiology specific guidance and example(s) see Appendix F.

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
1	4	SI	R	[0..1]		00569	Set ID –	OBX sequence number
2	2	ID	R	[0..1]	0125	00570	Value Type	See table 22
3	80	CE	R	[1..1]		00571	Observation Identifier	Composite
3.1		ST	O				Identifier	Recommend use, if available Agreed upon by trading partners Example: “1600” **NOTE:** The ZUH segment is required when sending cytology and/or pathology (surgical pathology) and microbiology (Culture results and antimicrobial sensitivities) reports.
3.2		ST	R				Text	Agreed upon by trading partners Example: “TSH”
3.3		IS	R		0396		Name of Coding System	See table 23. Use L= local for local field

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
3.4		ST	C				Alternate Identifier	Recommend use of LOINC Identifiers, if available see appendix C for guidance. Required field ,see appendix D
3.5		ST	C				Alternate Text	Recommend use of LOINC Identifiers, if available see appendix C for guidance. Required field ,see appendix D
3.6		IS	C		0396		Name of Alternate Coding System	Recommend use, If available. See table 23. Alternative coding system LOINC, must use "LN"
4	20	ST	*C	[0..1]		00572	Observation Sub-ID	**NOTE:** Required when reporting cytology, pathology (surgical pathology) and microbiology (Culture results and antimicrobial sensitivities) reports. See Appendix E and F
5	65536	*	C	[0..*]		00573	Observation Value	**Note:** For microbiology specific sub-field usage see Appendix F Required field, see appendix D
6	60	CE	C	[0..1]		00574	Units	Composite **Note:** When an observation's value is measured on a continuous scale, the measurement units within the units field in the OBX segment are required.
6.1		ST	O				Identifier	
6.2		ST	C				Text	

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SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
								Note: When an observation's value is measured on a continuous scale, the measurement units within the units field in the OBX segment are required.
6.3		IS	O				Name of Coding System	HL7 recommends ISO
6.4		ST	O				Alternative Identifier	
6.5		ST	O				Alternative Text	
6.6		IS	O				Name of Alternative Coding System	
7	60	ST	C	[0..1]		00575	Reference Ranges	**Note:** Required when the lab system is aware of the reference range for the reported tests.
8	10	ID	R	[0..5]	0078	00576	Abnormal Flags	See table 16 **Note:** See Appendix F for specific microbiology usage.
9							Probability	Not used at this time for the Laboratory Result Message
10	5	ID	O		0080	00578	Nature of abnormal test	See table 17
11	2	ID	R	[1..1]	0085	00579	Observation Result Status	See table 18
12 thru 13								Not used at this time for the Laboratory Result Message
14	26	TS	O			00582	Date/Time of the Observation	Recommend use, if available
15	60	CE	R	[1..1]		00583	Producer's ID	Composite
15.1		ST	R				Identifier	To be defined by trading partner

(Approved)

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
15.2		ST	R				Text	It is recommended to place the performing laboratory name, complete laboratory address and first and last name of lab/medical director in this element. See subcomponents (e.g. 15.2.1, 15.2.2)
15.2.1		ST	R				Laboratory name	
15.2.2		ST	R				Street Address	
15.2.3		ST	R				City	
15.2.4		ST	R				State	
15.2.5		ST	R				Zip	
15.2.6		ST	R				First Name of medical director	
15.2.7		ST	R				Last Name of medical director	
15.2.8		ST	R				Title:	Use: “Medical Director” or “Lab Director”
15.3		IS	R				Name of Coding System	Use L= local.
16	60	CN	O	[0..*]		00584	Responsible Observer	Composite
16.1							Identifier	
16.2		FN	O				Family Name	
16.3		ST	O				Given Name	
16.4		ST	O				Second and Further Given Names or Initials Thereof	
16.5		ST	O				Suffix	e.g. Jr or III, etc
16.6		ST	O				Prefix	e.g. Dr, etc
16.7		ST	O				Degree	e.g. M.D., etc

(Approved)

Table 7 - HL7 – ZUH – Utah Specific Segment

For column table heading definitions, see Appendix A – Basic Definitions

When cytology, pathology and microbiology (e.g. Culture results and antimicrobial sensitivities) laboratory results are sent the ZUH segment must contain required cytology, pathology and microbiology specific information (see below for details).

Note: It is the responsibility of each laboratory/hospital to identify the appropriate cytology, pathology and microbiology (e.g. Culture results and antimicrobial sensitivities) laboratory result type with the appropriate cytology, pathology and microbiology laboratory results contained within an organizations test dictionary.

Example:
ZUH|1|26438-2^Cytology Studies^LN or
ZUH|1|26439-0^Pathology Reports^LN or
ZUH|1|18725-2^Microbiology Tests^LN

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
1	4	SI	R	[0..1]			Set ID –	ZUH sequence number
2	200	CE	C	[1..1]			Message Subtype	Required when sending Cytology studies, Pathology reports and Microbiology tests (culture results and antimicrobial sensitivities). Not required for all other types of laboratory result (see below for identifier values)

(Approved)

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
2.1		ST	C				Identifier	Required when sending Cytology studies, Pathology reports and Microbiology tests (culture results and antimicrobial sensitivities). Use the following LOINC codes: “26438-2” (Cytology Studies) “26439-0” (Pathology Reports) “18725-2” (Microbiology Tests)
2.2		ST	C				Text	Required when sending Cytology studies, Pathology reports and Microbiology tests (culture results and antimicrobial sensitivities). Use the following LOINC text: “Cytology Studies” “Pathology Reports” “Microbiology Tests”
2.3		IS	C		0396		Name of Coding System	Use “LN” = LOINC

(Approved)

Table 8 - HL7 – MSH/ACK –Acknowledgement Header

(Please reference HL7 Acknowledgment and Error Status Specification #54
for those fields not addressed below)

For column table heading definitions, see Appendix A – Basic HL7 Definitions

Example MSH Segment-
MSH| ^~\&| |9999^| |1111^|20060126130405| |**ACK^R01**
|20060126130405|P|**2.2**| | |ER

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element	Comments
9	13	CM	R	[1..1]		00009	Message Type	Composite
9.1		ID	R				Message Type	Use “ACK”
9.2		ID	R				Trigger Event	Use “R01”
12	8	ID	R R	[1..1]		00012	Version ID	Composite
12.1		ID	R				Version ID	Use “2.2”

(Approved)

Table 9 - HL7 – MSA – Message Acknowledgement Segment

(Please reference HL7 Acknowledgment and Error Status Specification #54)

(Approved)

Table 10 - HL7 – ERR – Error Segment

(Please reference HL7 Acknowledgment and Error Status Specification #54)

(Approved)

Table 11 - HL7 User-Defined Table 0001 – Sex

Value	Description	Comments
F	Female	
M	Male	
O	Other	
U	Unknown	

(Approved)

Table 12 - HL7 Table 0038 – Order Status

Value	Description	Comments
A	Some, but not all, results available	
CA	Order was canceled	
CM	Order is completed	
DC	Order was discontinued	
ER	Error, order not found	
HD	Order is on hold	
IP	In process, unspecified	
RP	Order has been replaced	
SC	In process, scheduled	

(Approved)

Table 13 - HL7 Table 0065 – Specimen Action Code

Value	Description	Comments
A	Add ordered tests to the existing specimen	
G	Generated order; reflex order	
L	Lab obtained specimen from patient	
O	Specimen obtained by service other than lab	

(Approved)

Table 14 - HL7 Table 0070 – Source of Specimen

Code	Name	Code	Name	Code	Name
ABS	Abcess	IT	Intubation tube	STON	Stone
AMN	Amniotic fluid	LAM	Lamella	STL	Stool = fecal
ASP	Aspirate	WBC	Leucocytes	SWT	Sweat
BPH	Basophils	LN	Line	SNV	Synovial fluid
BLDA	Blood arterial	LNA	Line arterial		
BBL	Blood bag	LNV	Line venous	TEAR	Tears
BON	Bone	LYM	Lymphocytes	THRT	Throat
BRTH	Breath	MAC	Macrophages	THRB	Thrombocyte (platelet)
BRO	Bronchial	MAR	Marrow	TISS	Tissue
BRN	Burn	MEC	Meconium	TISB	Tissue bone
CALC	Calculus	MBLD	Menstrual blood	TISG	Tissue gall bladder
CDM	Cardiac muscle	MLK	Milk	TISL	Tissue lung
CNL	Cannula	NAIL	Nail	TISP	Tissue peritoneum
CTP	Catheter tip	NOS	Nose (nasal passage)	TISU	Tissue ulcer
CSF	Cerebral Spinal Fluid	ORH	Other	TISC	Tissue curettage
CVM	Cervical mucus	PRT	Peritoneal fluid/ascites	TISPL	Tissue placenta
CVX	Cervix	PER	Peritoneum	ULC	Ulcer
COL	Colostrum	PLC	Placenta	UMB	Umbilical blood
CBLD	Cord blood	PLAS	Plasma	URTH	Urethra
CNJT	Conjunctiva	PLB	Plasma bag	UR	Urine
CUR	Curettageputum	PLR	Pleural fluid	URC	Urine clean catch
CYST	Cyst	PMN	Polymorphonuclear neutrophils	URT	Urine catheter
DRN	Drain	PUS	Pus	VOM	Vomitus
EAR	Ear	SAL	Saliva	BLD	Whole blood
ELT	Electrode	SEM	Seminal fluid	BDY	Whole body
ENDC	Endocardium	SER	Serum	WICK	Wick
ENDM	Endometrium	SKN	Skin	WND	Wound
EOS	Eosinophils	SPRM	Spermatozoa	WNDA	Wound abscess
RBC	Erythrocytes	SPT	Sputum	WNDE	Wound exudates
FIB	Fibroblasts	SPTC	Sputum coughed	WNDD	Wound drainage
FLT	Filter	SPTT	Sputum tracheal aspirate		
FIST	Fistula				
FLU	Body fluid, unsp				
GAST	Gastric fluid				
GEN	Genital				
GENC	Genital Cervix				
GENL	Genital Lochia				
GENV	Genital Vaginal				
HAR	Hair				

(Approved)

Table 15 - HL7 Table 0074 – Diagnostics Service Section ID

Code	Description
AU	Audiology
BG	Blood gasses
BLB	Blood bank
CUS	Cardiac Ultrasound
CTH	Cardiac Catheterization
CT	CAT scan
CH	Chemistry
CP	Cytopathology
EC	Electrocardiz (e.g., EKG, EEC, holter)
EN	Electroneuro (EEG, EMG)
HM	Hematology
IMM	Immunology
MB	Microbiology
MCB	Mycobacteriology
MYC	Mycology
NMS	Nuclear medicine scan
NMR	Nuclear magnetic resonance
NRS	Nursing service measures
OUS	OB ultrasound
OT	Occupational therapy
OTH	Other
OSL	Outside lab
PHR	Pharmacy
PT	Physical therapy
PHY	Physician (Hx, Dx, admission note, etc.)
PF	Pulmonary function
RX	Radiograph
RUS	Radiology ultrasound
RC	Respiratory care (therapy)
RT	Radiation therapy
SR	Serology
SP	Surgical pathology
TX	Toxicology
VUS	Vascular Ultrasound
VR	Virology
XRC	Cineradiograph

(Approved)

Table 16- HL7 Table 0078 – Abnormal Flags

Value	Description	Comments
L	Below low normal	
H	Above high normal	
LL	Below lower panic limits	
HH	Above upper panic limits	
<	Below absolute low-off instrument scale	
>	Above absolute high-off instrument scale	
N	Normal	Applies to non-numeric results
A	Abnormal	Applies to non-numeric results
AA	Very Abnormal	Applies to non-numeric results, analogous to panic limits for numeric units.
U	Significant Change Up	
D	Significant Change Down	
B	Better -- use when direction not relevant	
W	Worse -- use when direction not relevant	
S	Susceptible, indicates for microbiology susceptibility only	
R	Resistant, indicates for microbiology susceptibility only	
I	Intermediate, indicates for microbiology susceptibility only	
MS	Moderately Susceptible, indicates for microbiology susceptibility only	
VS	Very Susceptible, indicates for microbiology susceptibility only	

(Approved)

Table 17 - HL7 Table 0080 – Nature of Abnormal Testing

Value	Description	Comments
A	An age-based population	
N	None – generic normal	
R	Range	
S	A race-based or sex-based population	

(Approved)

Table 18- HL7 Table 0085 – Observation Result Status Codes Interpretation

Value	Description	Comments
C	Record coming over is a correction and thus replaces a final result	
D	Deletes the OBX record	
F	Final results, Can only be changed with a corrected result	
P	Preliminary result	
X	Results cannot be obtained for this observation	
U	Result status change to final without retransmitting results already sent as 'preliminary'.	E.g. radiology changes status from preliminary to final
W	Post originals was wrong	E.g. transmitted for wrong patient

(Approved)

Table 19 - HL7 Table 0105 – Source of Comment

Value	Description	Comments
L	Ancillary (filler) department is source of comment	
P	Orderer (placer) is source of comment	
O	Other system is source of comment	

(Approved)

Table 20 - HL7 Table 0119 – Order Control Codes

Value[1]	Description	Originator[2]	Note[3]	Comment
NW	New Order	P	1	
OK	Order accepted & OK	F	1	
CA	Cancel order request	P	A	
OC	Order canceled	F		
CR	Canceled as requested	F	B	
UC	Unable to cancel	F	B	
DC	Discontinue order request	P	C	
OD	Order discontinued	F		
DR	Discontinued as requested	F		
UD	Unable to discontinue	F		
HD	Hold order request	P		
OH	Order held	F		
UH	Unable to put on hold	F		
HR	On hold as requested	F		
RL	Release previous hold	P		
OR	Released as requested	F		
UR	Unable to release	F		
RP	Order replace request	P	E, D, H	
RU	Replaced unsolicited	F	F, D, H	
RO	Replacement order	P, F	G, D, H, 1	
RQ	Replaced as requested	F	D, E, G, H	
UM	Unable to replace	F		
PA	Parent order	F	I	
CH	Child order	F	I	
XO	Change order request	P		
XX	Order changed, unsolicited	F		
UX	Unable to change	F		
XR	Changed as requested	F		
DE	Data errors	P, F		
RE	Observations to follow	P, F	J	
RR	Request received	P, F	K	
SR	Response to send order	F		
SS	Status request	P		
SN	Status changed	F	L	
NA	Send order number	P	L	
CN	Number assigned combined result combined result	F	M	

1 - The order control value field

2 - "F": Values originate from the filler and are not restricted to be sent only to the placer. "P": Values originate from the placer or other application with placer privileges (as agreed in interface negotiation.

3 - See table (Table notes for order control codes of ORC) notes below for explanation of codes.

(Approved)

Table 20 - HL7 Table 0119 – Order Control Codes (table notes for ORC segment)

Table 0119 note	Value	Description
A	CA	A cancellation is a request not to do a previously ordered service. Confirmation of the cancellation request is provided by the filler, e.g., a message with an ORC-1-order control value of CR
B	UC	An unable-to-cancel code is used when the ordered service is at a point that it cannot be canceled by the filler or when local rules prevent cancellation by the filler. The use of this code is dependent on the value of ORC-6-response flag.
C	DC	A discontinue request code is used to stop an ongoing ordered service. It is not the same as a cancellation request, which is used in an attempt to prevent an order from happening.

(Approved)

<table>
<tr>
<td>D</td>
<td>RP,
RQ,
RU,
RO</td>
<td>A replacement is the substitution of one or more orders for one or more previously ordered services The replaced orders are treated as though they were canceled. If and when
an ordered service can be replaced are local site-specific determinations.

Use the parent/child order control codes if the site specifies that the original order must remain intact. Do not use the replacement codes under this circumstance.

For each order to be replaced, use an ORC-1-order control value of RP (request for a replacement going to a filler) or RU (an unsolicited replacement created by the filler) used by the filler to notify the placer and/or other systems). By local agreement, the ORC segment (with RP or RU) may be followed by its original order detail segment. The ORC segments (with RP or RU) must be followed by an ORC segment with an ORC-1-order control value of RO (indicating the replacement order). By local agreement, the ORC with the RO value may be followed by an order detail segment.

For example, suppose that an ancillary application were replacing two OBR orders with three different orders. The sequence of segments would be as follows:

RU and RO usage (example)

<table>
<tr><th>Segment</th><th>Order Control</th><th>Comment</th></tr>
<tr><td>ORC</td><td>RU</td><td>1st replaced ORC</td></tr>
<tr><td>OBR</td><td></td><td>1st replaced order's detail segment</td></tr>
<tr><td>ORC</td><td>RU</td><td>2nd replaced ORC</td></tr>
<tr><td>OBR</td><td></td><td>2nd replaced order's detail segment</td></tr>
<tr><td>ORC</td><td>RO</td><td>1st replacement ORC</td></tr>
<tr><td>OBR</td><td></td><td>1st replacement order's detail segment</td></tr>
<tr><td>ORC</td><td>RO</td><td>2nd replacement ORC</td></tr>
<tr><td>OBR</td><td></td><td>2nd replacement order's detail segment</td></tr>
<tr><td>ORC</td><td>RO</td><td>3rd replacement ORC</td></tr>
<tr><td>OBR</td><td></td><td>3rd replacement order's detail segment</td></tr>
</table>

Whether the OBR segments must be present is determined by the value of ORC-6-response flag.

The described replacement method will handle all possible cases of replacement: oneintoone, manyintoone, oneintomany, and manyintomany. If the placer sent this request to the filler with two RPs, and this was a response back from the filler to the placer, the two RUs (replaced</td>
</tr>
</table>

(Approved)

<table>
<tr><td></td><td></td><td>unsolicited) would be two RQs (replaced as requested).

RQ and RO usage (example)

<table>
<tr><th>Segment</th><th>Order Control</th><th>Comment</th></tr>
<tr><td>ORC</td><td>RQ</td><td>1st replaced ORC</td></tr>
<tr><td>OBR</td><td></td><td>1st replaced order's detail segment</td></tr>
<tr><td>ORC</td><td>RQ</td><td>2nd replaced ORC</td></tr>
<tr><td>OBR</td><td></td><td>2nd replaced order's detail segment</td></tr>
<tr><td>ORC</td><td>RO</td><td>1st replacement ORC</td></tr>
<tr><td>OBR</td><td></td><td>1st replacement order's detail segment</td></tr>
<tr><td>ORC</td><td>RO</td><td>2nd replacement ORC</td></tr>
<tr><td>OBR</td><td></td><td>2nd replacement order's detail segment</td></tr>
<tr><td>ORC</td><td>RO</td><td>3rd replacement ORC</td></tr>
<tr><td>OBR</td><td></td><td>3rd replacement order's detail segment</td></tr>
</table>
</td></tr>
<tr><td>E</td><td>RP
RQ</td><td>RP- The order replace request code permits the order filler to replace one or more new RQ orders with one or more new orders, at the request of the placer application.
RQ- orders with one or more new orders, at the request of the placer application.

In the case of the RP type (i.e., a replacement request from another application to the filler),
the placer order number is generated by the placer application using the procedure for new orders. The filler order number is generated by the filler application using the procedure identical for new orders.
If a replacement sequence is used in an ORU message (i.e., during results reporting), the following are the recommended segments to be used for the replacement orders:

1) ORC with an order control value of RO

2) Any OBR segments (can be replaced by any order detail segments)

3) Optionally followed by observation result segments (OBX)

4) NTE segments can appear after the OBR (or any order detail segment) or after an OBX segment as in a regular ORU message</td></tr>
<tr><td>F</td><td>RU</td><td>The unsolicited replacement code permits the filler application to notify another application without being requested from the placer application.</td></tr>
<tr><td>G</td><td>RO
RQ</td><td>RO- The replacement order code is sent by the filler application to another application indicating.
RQ- the exact replacement ordered service. It is used with the RP and RU order control codes as described above.</td></tr>
</table>

(Approved)

<table>
<tr><td>H</td><td>RP
RQ
RU
RO</td><td>RP- The rules for the order numbers in ORC segments with an order control value of RO.
RQ- are determined by the replacement type (RP or RU).
RU and RO- In the case of the RU type (i.e., unsolicited replacement by the filler), the filler order number is generated as usual by the filler application. The placer order number is identical to the placer order number of the first transmitted ORC with an order control value of RU.</td></tr>
<tr><td>I</td><td>PA
CH</td><td>PA- The parent (PA) and child (CH) order control codes allow the spawning of "child"
CH- orders from a "parent" order without changing the parent (original order). One or more ORC segments with an ORC-1-order control value of PA are followed by one or more ORC segments with an ORC-1-order control value of CH. Whether OBR segments must be present is determined by the value of ORC-6-response flag.

For example, suppose that a microbiology culture produced two organisms and corresponding sensitivity reports. Then the sequence of segments would be as follows:

Example of two child orders
Segment Order Control Comment
ORC PA 1st parent ORC
ORC CH 1st child ORC
OBR 1st child order

ORC CH 2nd child ORC
OBR 2nd child order

The assignment of placer numbers in the parent-child paradigm depends on whether the placer of filler creates the child order and in the latter case, on whether the placer supports the SN/NA transaction. If the placer creates the child orders it will assign their placer numbers according to its usual procedures. If the filler creates the child orders there are two possibilities: each child will inherit the placer number of its parent, or the filler will use the SN/NA transaction to request that the placer assign a placer number. In either case, the filler application creates the filler numbers of the children according to its usual procedures.

Whenever a child order is transmitted in a message the ORC segment's ORC-8-parent is valued with the parent's filler number (if originating from the filler) and with the parent's placer number (if originating from the filler or if originating from the placer).

The parent child mechanism can be used to "expand" a parent order (e.g., an order for three EKGs on successive mornings)</td></tr>
<tr><td>J</td><td>RE</td><td>RE - The observations-to-follow code is used to transmit patient-specific information with an order. A order detail segment (e.g., OBR) can be followed by one or more observation segments (OBX). Any observation that can be transmitted in an ORU message can be transmitted with this mechanism. When results are transmitted with an order, the results should immediately follow the order or orders that they support.

The following example shows the sequence of segments for three Pharmacy orders. It illustrates the use of the RE code:</td></tr>
</table>

(Approved)

		RE usage (example) Segment Order Control Comment MSH PID ORC NW First new order RXO First order segment ORC NW 2nd new order RXO 2nd order segment [ORC RE Patient-specific observation, OBR] optional in V 2.2 OBX Observation OBR, optional in OBX V 2.2 OBX An observation segment OBX Another observation segment Another observation segment ORC NW Another observation segment RXO 3rd order 3rd order segment In this version of HL7, results can be transmitted with an order as one or more OBX segments without the necessity of including the ORC and OBR segments. Observations can be transmitted in an ORU message without using an ORC. There are times when it is necessary to transmit information not included in the OBR segments of the ORU message. In this case, it is recommended that the ORC be included in the ORU message. The order control value of RE is required only in ORM messages to indicate that an order is followed by observation results (OBX). The RE code is not necessary in the ORU message because it is expected that the OBR segments can be followed by observation results (OBX).
K	RR	Left in for backwards compatibility. In the current version it is equivalent to an accept acknowledgement. The request-received code indicates that an order message has been received and will be processed later. The order has not yet undergone the processing that would permit a more exact response.
L	SN	There are three circumstances that involve requesting an order number (ORC-2-placer NA order number or ORC-3-filler order number): NW 1) When the filler application needs to request an ORC-3-filler order number from a centralized application (e.g., HIS) 2) When the filler application needs to request an ORC-2-placer order number from some other application (e.g., Order Entry) 3) When an application (not the filler application) wants to assign an ORC-3-filler order number for a new order

(Approved)

The filler application needs a centralized filler order number

SN

The send order number code provides a mechanism for the filler to request an ORC-3-filler order number from some centralized application (called "other" in the table below), such as a central HIS, by sending an ORM message containing an ORC-1-order control value of SN. This ORC has a null ORC-3-filler order number and an ORC-2-placer order number created by the filler application when the filler originates the order. The ORM (SN type) message can be acknowledged by two methods: i) By an ORR message containing an ORC-1-order control value of OK. An unsolicited ORM message can be sent at a future time, containing an ORC with ORC-1-order control value of NA. ii)By an ORR message containing an ORC-1-order control value of NA as described below.

NA

The number assigned code allows the "other" application to notify the filler application of the newly assigned filler order number. ORC-1-order control contains value of NA, ORC-2-placer order number (from the ORC with the SN value), and the newly assigned filler order number.

Note: Both the placer order number and the filler order number have the filler's application ID.

Code	From	ORC-2 Place Order #	ORC-3 Filler Order #
SN	Filler Application	Placer order number^filler application ID	Null
NA	Other Application	Placer order number^filler application ID	Filler order number^filler application ID

The filler application needs a placer order number

SN

The send order number code provides a mechanism for the filler application to request an ORC-2-placer order number from another application (called "other" in the table below) by sending an ORM message containing an ORC-1-order control value of SN. This ORC has a null ORC-2-placer order number and an ORC-3-filler order number created by the filler application when the filler originates the order. The ORM (SN type) message can be acknowledged by two methods: i) By an ORR message containing an ORC-1-order control value of OK. An unsolicited ORM message can be sent at a future time, containing an ORC-1-order control value of NA. ii) By an ORR message containing an ORC-1-order control value of NA as described below.

NA

The number assigned code allows the "other" application to notify the filler application of the newly assigned ORC-2-placer order number. The ORC contains an ORC-1-order control value of NA, the newly assigned ORC-2-placer order number, and the ORC-3-filler order number (from the ORC with the SN value).

(Approved)

<table>
<tr><td></td><td></td><td>
Note: The new ORC-2-placer order number has the placer's application ID.

<table>
<tr><th>Code</th><th>From</th><th>ORC-2 Place Order #</th><th>ORC-3 Filler Order #</th></tr>
<tr><td>SN</td><td>Filler Application</td><td>Null</td><td>Filler order number^filler application ID</td></tr>
<tr><td>NA</td><td>Other Application</td><td>Placer order number^filler application ID</td><td>Filler order number^filler application ID</td></tr>
</table>

An application wants to assign a filler order number

NW
When the application creating an order (not the filler application) wants to assign a filler order number for a new order
or
RO
(RO following an RP). In this case, the "other" application completes ORC-3-filler order number, using the filler application ID as the second component of the filler order number.

<table>
<tr><th>Code</th><th>From</th><th>ORC-2 Place Order #</th><th>ORC-3 Filler Order #</th></tr>
<tr><td>NW or RO</td><td>Other Application to the filler</td><td>Placer order number^filler application ID</td><td>Filler order number^filler application ID</td></tr>
</table>
</td></tr>
<tr><td>M</td><td>CN</td><td>
The combined result code provides a mechanism to transmit results that are associated with two or more orders. This situation occurs commonly in radiology reports when the radiologist dictates a single report for two or more exams represented as two or more orders. For example, knee and hand films for a rheumatoid arthritis patient might generate a single dictation on the part of the radiologist.

When such results are reported the CN code replaces the RE code in all but the last ORC, and the results follow the last ORC and its OBR. An example follows of a single report following three ORCs:
MSH|... PID|... ORC|CN|... OBR||A4461XA^HIS|81641^RAD|73666^Bilateral Feet|... ORC|CN|... OBR||A4461XB^HIS|81642^RAD|73642^Bilateral Hand PA|... ORC|RE|... OBR||A4461XC^HIS|81643^RAD|73916^Bilateral Knees|...
OBX||CE|73916&IMP||Radiologist's Impression|...
OBX||CE|73642&IMP||Radiologist's Impression|...
OBX||FT|73642&GDT||Description|...
</td></tr>
</table>

(Approved)

Table 21 - HL7 Table 0123 – Result Status for OBR Segment

Value	Description	Comments
O	Order received; specimen not yet received	
I	No results available; specimen received, procedure incomplete	
S	No results available; procedure scheduled, but not done	
A	Some, but not all, results available	
P	Preliminary, A verified early result is available, final results not yet obtained	
C	Correction to results	
R	Results stored, not yet verified	
F	Final results, results stored and verified, Can only be changed with a corrected result	
X	No results available, Order canceled	
Y	No order on record for this test	Used only on queries
Z	No record of this patient	Used only on queries

(Approved)

Table 22 - HL7 Table 0125 – Value Type

Value	Description	Comments
AD	Address	
CE	Coded Entry	Bolded
CF	Coded Element with Formatted Values	
CK	Composite ID With Check Digit	
CN	Composite ID and Name	
CP	Composite Price	
CX	Extended Composite ID with Check Digit	
DT	Date	
ED	Encapsulated Data	
FT	Formatted Text	Display, bolded
MO	Money	
NM	Numeric	Bolded
PN	Person Name	
RP	Reference Pointer	
SN	Structured Numeric	Bolded
ST	String Data	Bolded
TM	Time	
TN	Telephone Number	
TS	Time Stamp (Date & Time)	
TX	Text Data	Display, bolded
XAD	Extended Address	
XCN	Extended Composite Name and Number For Person	
XON	Extended Composite Name and Number For Organizations	
XPN	Extended Person Name	
XTN	Extended Telecommunication Number	

(Approved)

Table 23 - HL7 User-Defined Table 0396 – Coding System

Value	Description	Comments
99zzz	Local general code, where zzz is an alphanumeric character	Use L = local
C4	CPT-4	
HPC	HCFA Procedure Code (HCPCS)	
I10P	ICD-10 Procedure Code	
I9C	ICD-9CM	
LN	Logical Observation Identifier Names and Codes (LOINC®)	
SNM	Systemized Nomenclature of Medicine (SNOWMED)	
SNM2	SNOWMED 2	
SNM3	Snowmed International (SNOWMED 3)	
SCT	Snowmed CT	

(Approved)

Appendix C – LOINC Coding Recommended Guide

(Approved)

LOINC Coding Recommended Guide

Organizations reported that they utilize their own organization specific test order/result codes today. This Standard allows existing organization specific codes to be reported in the following fields:

- OBR-4.1 to 4.3 and
- OBX-3.1 to 3.3.

Logical Observation Identifiers Names and Codes (LOINC) is a standard, non-proprietary coding system for laboratory tests and other clinical observations. LOINC codes uniquely identify tests based on a combination of their features, including the analyte being measured, the specimen being tested, and the test methodology being used. Over 25,000 LOINC codes exist for laboratory tests. See www.loinc.org for additional information.

Utilizing LOINC codes for laboratory test orders/results is an approach to standardize how organizations can uniquely identify test orders/results across different organizations.

Some national efforts (e.g. www.elinics.org) exist which have identified common test orders/results LOINC codes that have significant volume.

This Standard recommends the use of LOINC identifiers be included (but not required) in the following fields:

- OBR-4.4 to 4.6 and
- OBX-3.4 to 3.6.

(Approved)

Appendix D —Additional Requirements When Sending the State of Utah Reportable Laboratory Results

(Approved)

Additional Requirements When Sending State Reportable Laboratory Results to the State of Utah

This Laboratory Result Standard is a guide for organizations who wish to send state reportable laboratory results electronically to the State of Utah. The types of diseases, which are state reportable are listed at (http://health.utah.gov/epi/report.html). Table 1 and 2 detail the data element(s) where LOINC codes are required when sending state reportable laboratory results to the Utah Department of Health. Table 3 details the data elements where SNOMED CT codes are required to identify an organism when sending state reportable laboratory results to the Utah Department of Health.

Table 1 HL7 Attribute Table – OBR – Observation Request

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
4.4		ST	R				Alternate Identifier	Must use LOINC Identifiers
4.5		ST	R				Alternate Text	Must use LOINC text
4.6		IS	R				Name of Alternate Coding System	Must use “LN”

Table 2 HL7 Attribute Table – OBX – Observation/Result Segment

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
3.4		ST	R				Alternative Identifier	Must use LOINC Identifiers
3.5		ST	R				Alternative Text	Must use LOINC text
3.6		IS	R				Name of Alternative Coding System	Must use “LN”

(Approved)

Table 3 - HL7 Attribute Table – OBX – Observation/Result Segment

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
5.4		ST	R				Alternative Identifier	Must Use SNOMED- CT Identifiers to identify an organism
5.5		ST	R				Alternative Text	Must Use SNOMED- CT Text to identify an organism
5.6		IS	R				Name of Alternative Coding System	Must Use “SCT”

(Approved)

Appendix E – Cytology and Pathology Specific Implementation Guide

(Approved)

Cytology and Pathology Specific Implementation Guide

When cytology and pathology laboratory results are sent the ZUH segment must contain required cytology and pathology specific information (see ZUH segment for details).

NOTE:
It is the responsibility of each laboratory/hospital to identify the appropriate cytology and pathology laboratory result type with the appropriate cytology and pathology laboratory results contained within an organizations test dictionary.

This Standard also allows trading partners to determine if they will exchange either free-text or discrete based cytology and pathology laboratory results.

Cytology laboratory result examples include:

- OBX Example 1 is a free-text based cytology laboratory result example.
- OBX Example 2 is a discrete based cytology laboratory result example.

Pathology laboratory result examples include:

- OBX Example 1 is a free-text based pathology laboratory result example.
- OBX Example 2 is a discrete based pathology laboratory result example.

(Approved)

OBX Example 1[4] - Free-text based cytology laboratory result example

OBX|1|TX|^Pap Smear Report^L|1| CASE: LDC-99-999999 PATIENT: Jody Smith Gynecologic Pap Smear, Cervical ThinPrep Pap Automated Imaging Test / HPV Reflexive Testing DESCRIPTIVE DIAGNOSIS: ATYPICAL SQUAMOUS CELLS, of Undetermined Significance Specimen Adequacy: Satisfactory for evaluation Transformation zone component identified HPV Testing Results: Negative for high-risk types of HPV Performed at Hospital B, SLC, Utah Recommendation: The ASCCP has recommended that this group of women be followed-up with repeat cytology at 12 months. Sharon Tom CT(ASCP) Reviewed at Lab Electronically signed 11/11/2006 John Smith M.D. Pathologist Electronically signed 11/11/2006| | | N| | |F| |200611111111 |SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
NTE|1|L| HPV Testing performed with Hybrid Capture II (DIGENE Corporation). High-risk HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68. A negative result does not rule out the presence of HPV.
ZUH|1|26438-2^Cytology Studies^LN

OBX Example 2 - Discrete based cytology laboratory result example

OBX|1|TX|^CASE:^L|1| LDC-99-999999| | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|2|TX|^PATIENT:^L|2|Jody Smith| | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|3|TX|^DESCRIPTIVE DIAGNOSIS:^L|3| ATYPICAL SQUAMOUS CELLS, of Undetermined Significance| | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|4|TX|^Specimen Adequacy:^L|4| ATYPICAL SQUAMOUS CELLS, of Undetermined Significance| | | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|5|TX|^DESCRIPTIVE DIAGNOSIS:^L|5| Satisfactory for evaluation Transformation zone component identified | | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|6|TX|^HPV Testing Results: ^L|6| Negative for high-risk types of HPV | | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
NTE|1|L|HPV Testing performed with Hybrid Capture II (DIGENE Corporation). High-risk HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68. A negative result does not rule out the presence of HPV.
OBX|7|TX|^Performed at^L|7| Hospital B, SLC, Utah | | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|8|TX|^Recommendation:^L|8| The ASCCP has recommended that this group of women be followed-up with repeat cytology at 12 months.| | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|9|TX|^ Reviewed at Lab Electronically signed^L|9|Sharon Tom CT(ASCP) 11/11/2006 | | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|10|TX|^ Pathologist Electronically signed ^L|10| John Smith M.D. 11/11/2006| | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
ZUH|1|26438-2^Cytology Studies^LN

[4] Formatting characters are not displayed in these examples and should be agreed upon by trading partners.

(Approved)

OBX Example 3 - Free-text based pathology laboratory result example[5]

OBX|1|TX|^Pathology Report^L|1| CASE: LDC-06-028284 PATIENT: Jody Smith FINAL DIAGNOSIS:A. SEGMENTAL RESECTION OF STOMACH, DUODENUM, PANCREAS, WITH SPLENECTOMY - MULTIPLE LOW GRADE NEUROENDOCRINE TUMORS PRESENT RANGING FROM MICROSCOPIC DISEASE TO 4.5 CM IN GREATEST DIMENSION. MICROSCOPIC TUMOR IS PRESENT AT THE SOFT TISSUE MARGIN OF RESECTION OF DUODENUM AND PANCREAS (SEE MICROSCOPIC). METASTATIC TUMOR IS IDENTIFIED IN TWO OF FIVE LYMPH NODES (2/5). B. HEAD OF PANCREAS TUMOR, EXCISION - METASTATIC TUMOR EXTENSIVELY INVOLVING A SINGLE LYMPH NODE (1/1). SNOMED T-CODE: T59000SNOMED M-CODE: M81500 MICROSCOPIC EXAMINATION: Histology sections show multiple low-grade neuroendocrine tumors involving the wall of the stomach, duodenum, pancreatic parenchyma, and metastatic to lymph nodes. The spleen is grossly and histologically uninvolved by tumor. The low-grade neuroendocrine neoplasms are characterized by nests of tumor cells with focal trabecular and acinar growth patterns. GROSS EXAMINATION: A. The specimen is designated "stomach, spleen, pancreas, duodenum" and consists of a segmental resection of stomach and small bowel. The stomach is closed by a staple line on one margin. The resection of stomach has overall dimensions of 15 x 9 x 1.5 cm. The stapled margin is 13 cm in length. There appears to be a short segment of pylorus and small bowel attached to the distal end of the stomach approximately 3.5 cm in length. John Smith M.D. Pathologist Electronically signed 11/11/2006| | | N| | |F| |200611111111 |SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
ZUH|1|26439-0^Pathology Reports^LN

[5] Formatting characters are not displayed in these examples and should be agreed upon by trading partners.

(Approved)

OBX Example 4 - Discrete based pathology laboratory result example

OBX|1|TX|^CASE:^L|1| LDC-06-028284| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|2|TX|^PATIENT:^L|2|Jody Smith| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|3|TX|^ FINAL DIAGNOSIS:^L|3| A. SEGMENTAL RESECTION OF STOMACH, DUODENUM, PANCREAS, WITH SPLENECTOMY - MULTIPLE LOW GRADE NEUROENDOCRINE TUMORS PRESENT RANGING FROM MICROSCOPIC DISEASE TO 4.5 CM IN GREATEST DIMENSION. MICROSCOPIC TUMOR IS PRESENT AT THE SOFT TISSUE MARGIN OF RESECTION OF DUODENUM AND PANCREAS (SEE MICROSCOPIC). METASTATIC TUMOR IS IDENTIFIED IN TWO OF FIVE LYMPH NODES (2/5). B. HEAD OF PANCREAS TUMOR, EXCISION - METASTATIC TUMOR EXTENSIVELY INVOLVING A SINGLE LYMPH NODE (1/1). | | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|4|TX|^ SNOMED T-CODE:^L|4|T59000| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|5|TX|^ SNOMED M-CODE:^L|5| M81500| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|6|TX|^ MICROSCOPIC EXAMINATION:^L|6| Histology sections show multiple low-grade neuroendocrine tumors involving the wall of the stomach, duodenum, pancreatic parenchyma, and metastatic to lymph nodes.| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|7|TX|^ GROSS EXAMINATION:^L|7|Histology sections show multiple low-grade neuroendocrine tumors involving the wall of the stomach, duodenum, pancreatic parenchyma, and metastatic to lymph nodes. The spleen is grossly and histologically uninvolved by tumor. The low-grade neuroendocrine neoplasms are characterized by nests of tumor cells with focal trabecular and acinar growth patterns| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
OBX|8|TX|^ Pathologist Electronically signed:^L|8| John Smith M.D. 11/11/2006| | | | |N| | |F|SL^Hospital ABC& 120 W 600 South&Salt Lake City&UT&84103&John&Smith&Medical Director^L| |
ZUH|1|26439-0^Pathology Reports^LN

(Approved)

Appendix F –Microbiology (Culture and antimicrobial sensitivities) Specific Implementation Guide

(Approved)

Microbiology (Culture and antimicrobial sensitivities) Specific Implementation Guide

This Standard allows trading partners to determine if they will exchange either free-text or discrete based microbiology laboratory results.

For discrete based microbiology laboratory results this appendix aligns, where possible, the requirements contained in version 3.0 of the ELINCS[6] documentation. Modifications to these requirements are in *italics.*

Specific OBR and OBX segments must be appropriately associated when reporting culture and sensitivity laboratory results. This appendix describes the requirements of reporting culture and antimicrobial sensitivity laboratory results.

OBX (Preliminary) Example 1 – Free-text based microbiology (culture) laboratory result example

OBR|1|Q55555555^9999^|0506DE188424^9999^|5863^Spt Routine Cult^L^6460^Spt Routine Cult^LN|||20070114|||||||| ||||||200701181430-0800|||F<cr>
OBX|1|TX|721^Urine Culture^L^11475-1^MICROORGANISM IDENTIFIED^LN~65151^Micro report^L^11475-1^MICROORGANISM IDENTIFIED^LN[1] |1[2]|
626^Aureus. Beta Hemolytic^L^3092008^Staphylococcus aureus^SCT~754^Beta Hemolytic^L^412643004^Beta hemolytic Streptococcus A^SCT[3] ||||||P|...<cr>
ZUH|1|18725-2^Microbiology Tests^LN

OBX (Final) Example 2 – Free-text based microbiology (culture) laboratory result example

OBR|1|Q55555555^9999^|0506DE188424^9999^ |5863^Spt Routine Cult^L^6460^Spt Routine Cult^LN|||20070114|||||||| ||||||200701181430-0800|||F<cr>
OBX|1|TX|721^Urine Culture^L^11475-1^MICROORGANISM IDENTIFIED^LN[1]~754^Beta Hemolytic^L^412643004^Beta hemolytic Streptococcus A^SCT |1[2]|Colony count 10000 – 90000 per ML Aureus ~ Colony count <1000 per ML Beta Hemolytic.[3]|||~~A~~||F|...<cr>
ZUH|1|18725-2^Microbiology Tests^LN

Superscript 1: OBX-3 Observation Identifier
Superscript 2: OBX-4 Observation Sub-ID
Superscript 3: OBX-5 Observation Value

[6] EHR- Laboratory Interoperability and Connectivity Specification (www.elincs.org).

(Approved)

OBX (Preliminary) Example 3 - Discrete based microbiology (culture) laboratory result example

OBR|1|*Q55555555^9999^|0506DE188424^9999^|5863^Spt Routine Cult^L^6460^Spt Routine Cult^LN*|||20070114|||||||||
||||||200701181430-0800|||P<cr>

OBX|1|CE|*65151^Micro report^L^11475-1^MICROORGANISM IDENTIFIED^LN*[1]|1[2]|
626^Aureus^L^3092008^Staphylococcus aureus^SCT[3]|||A|||P|...<cr>

OBX|3|CE|*65151^Micro report^L^11475-1^MICROORGANISM IDENTIFIED^LN*[1]|2[2]|*754^Beta Hemolytic^L*^412643004^Beta hemolytic Streptococcus A^SCT[3]|||A|||P|...<cr>

Superscript 1: OBX-3 Observation Identifier
Superscript 2: OBX-4 Observation Sub-ID
Superscript 3: OBX-5 Observation Value

OBX (Final) Example 4 - Discrete based microbiology (culture) laboratory result example

OBR|1|*Q55555555^9999^|0506DE188424^9999^|5863^Spt Routine Cult^L^6460^Spt Routine Cult^LN*|||20070114|||||||||
||||||200701181430-0800|||F<cr>

OBX|1|CE|*65151^Micro report^L^11475-1^MICROORGANISM IDENTIFIED^LN*[1]|1[2]|
626^Aureus^L^3092008^Staphylococcus aureus^SCT[3]|||A|||F|...<cr>

OBX|2|SN|*234^Count^L^564-5^COLONY COUNT^LN*|1[2]|^10000^-^90000|||A|||F|...<cr>

OBX|3|CE|*65151^Micro report^L^11475-1^MICROORGANISM IDENTIFIED^LN*[1]|2[2]|*754^Beta Hemolytic^L*^412643004^Beta hemolytic Streptococcus A^SCT[3]|||A|||F|...<cr>

OBX|4|SN|*234^Count^L^564-5^COLONY COUNT^LN*|2[2]|<^1000|||A|||F|...<cr>
ZUH|1|18725-2^Microbiology Tests^LN

Superscript 1: OBX-3 Observation Identifier
Superscript 2: OBX-4 Observation Sub-ID
Superscript 3: OBX-5 Observation Value

(Approved)

OBX-3 Observation Identifier (for discrete culture laboratory results)

For OBX segments in which a cultured organism is identified *in OBX-3.1, 3.2 and 3.3 are values agreed upon by trading partners (in many cases organization specific identifiers and/or values). In OBX-3.4, 3.5 and 3.6* an appropriate LOINC® code *is recommended if* used, i.e., a code with the LOINC® component value of "MICROORGANISM IDENTIFIED"[7]. There are approximately 175 such LOINC® codes in version 2.15 of the LOINC® terminology, varying with respect to the method of culture and the specimen type.

Sample Values *(in OBX-3.4. 3.5 and 3.6)*:

600-7^MICROORGANISM IDENTIFIED:BLD:BLOOD CULTURE^LN

[LOINC® code for organism identified in blood culture]

6460-0^MICROORGANISM IDENTIFIED:SPT:ROUTINE BACTERIAL CULTURE^LN

[LOINC® code for organism identified in blood culture]

628-8^MICROORGANISM IDENTIFIED:TISS:ANAEROBIC CULTURE^LN

[LOINC® code for organism identified in anaerobic tissue culture]

For OBX segments in which the colony count of a cultured organism is reported, an appropriate LOINC® code *is recommended if* used, i.e., a code with the component value of "COLONY COUNT". There are approximately 10 such LOINC® codes in version 2.15 of the LOINC® terminology.

Sample Values *(in OBX-3.4. 3.5 and 3.6)*:

564-5^COLONY COUNT:NUM:QN^LN

20774-6^COLONY COUNT:ACNC:QN^LN

For OBX segments that report any other aspect of a culture result (including a negative result), the coding of the Observation Identifier field is not specified *in this Standard*. The laboratory may report such observations using its proprietary codes or any other coding system *in OBX-3.1, 3.2 and 3.3*.

OBX-4 Observation Sub-ID Usage *(for discrete culture laboratory results)*

Each OBX segment that reports a culture result must have the Observation Sub-ID field populated. OBX segments that contain information pertaining to the same identified microorganism must be "grouped" via the same value in the Observation Sub-ID field. For example, the first two OBX segments in example 4 contain information pertaining to the Staphylococcus Aureus organism identified (in this case, the identity of that organism and its colony count). These OBX segments, therefore, both have the Observation Sub-ID value of "1". The second two OBX segments contain information pertaining to the Beta-hemolytic Streptococcus A organism, and both have the Observation Sub-ID value of "2".

[7] For more information about LOINC® codes (including component values) and a copy of the LOINC® database, see www.LOINC.org

(Approved)

Note: Even if only one OBX segment appears for each identified organism, the Observation Sub-ID field must be populated in these OBX segments, because the value of the Observation Sub-ID field is used to reference the appropriate OBX segment in subsequent reporting of antimicrobial sensitivities (*See OBR-26 later in this appendix*). Even in the case that only a single OBX segment is used to report a culture result, the Observation Sub-ID field must be populated, for the same reason. For example, if only one organism had been identified in example 4 and no colony counts had been reported, the Observation Sub-ID field would still need to contain the value "1".

Note: Within any OBR segment, the OBX segments must be sequenced such that they are grouped by their Observation Sub-ID values. For example, in the culture result shown *in example 4*, the OBX segments with the Observation Sub-ID value "1" all appear before the OBX segments with the Observation Sub-ID value "2". This sequencing ensures that culture results will be displayed to users correctly by EHR systems that display result details in the same sequence as they are received.

Note: Within any OBR segment, each OBX segment must have a unique combination of OBX-3 (Observation Identifier) and OBX-4 (Observation Sub-ID) values. Note that in the first and third OBX segments of the example above, the values of OBX-3 are the same ("*65151^Micro report^L^ 11475-1^MICROORGANISM IDENTIFIED^LN*"), necessitating that the values of OBX-4 are different ("1" and "2", respectively). The following would not be a valid message, because OBX segments appear with duplicate combinations of OBX-3 and OBX-4 values:

Note: When the results of a specific culture are sent more than once (for example, as a preliminary result and later as a final result), the combination of OBX-3 (Observation Identifier) and OBX-4 (Observation Sub-ID) values for the identified organisms **must be the same in each result message that is sent**. This consistency allows the receiving EHR systems to correctly update the identified organisms as they are revised by the lab. The example below shows the preliminary and the (subsequently sent) final values of a sputum culture, with the OBX-3 (Observation Identifier) and OBX-4 (Observation Sub-ID) values maintained correctly.

OBX-5 Observation Value *(for discrete culture laboratory results)*

*For discrete culture laboratory results, t*he value of each organism identified by a culture must be represented by a *coded entity* (CE data type). *The values used in the first, second and third components are values agreed upon by trading partners (in many cases organization specific identifiers and/or values,).* Although no specific coding system is required, it is strongly recommended that the SNOMED CT terminology be used to encode the organism. Use of a standard coding system, such as SNOMED CT, will enable important reporting and decision-support capabilities for infectious diseases. When SNOMED codes are used, the SNOMED CT concept ID should appear in the *fourth* component of OBX-5 and the coding system designator "SCT" should appear in the *sixth* component. The *fifth* component should be populated with an accurate text description of the organism identified, typically the preferred display term as assigned by the SNOMED CT terminology. Regardless of the coding system used, the first *six* components of OBX-5 must be populated with the code, text description, and coding-system designator, respectively. *See table 24 for specific requirements for microbiology culture laboratory results in OBX-5.*

Note: The SNOMED CT terminology is available free of charge within the Unified Medical Language System (UMLS) Thesaurus of the National Library of Medicine. See www.nlm.nih.gov/research/umls.

Note: Use of the SNOMED CT terminology is most useful for encoding the Observation Value in the OBX that identifies an organism (e.g., the *fourth* and *sixth* OBX segments in *example 3 and 4*). The Observation Value for colony counts or other observations related to the culture may be represented in any reasonable way chosen by the laboratory.

(Approved)

Table 24 HL7 Attribute Table – OBX-5 – Observation/Result Segment (Discrete culture results)

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	Element Name	Comments and Examples
5.1		ST	*O*				Identifier	*Recommended use, if available* *Agreed upon by trading partners*
5.2		ST	*R*				Text	*Agreed upon by trading partners*
5.3		IS	*R*				Name of Coding System	*"L"*
5.4		ST	*C*				Alternative Identifier	*Recommend Use SNOMED- CT Identifiers* Required field ,see appendix D
5.5		ST	*C*				Alternative Text	*Recommend Use SNOMED- CT Text* Required field ,see appendix D
5.6		IS	*C*				Name of Alternative Coding System	*Recommend Use "SCT"* Required field ,see appendix D

(Approved)

Antimicrobial Sensitivities

Antimicrobial sensitivity (or susceptibility) results report the sensitivity of cultured microorganisms to specific antibiotics, a standard part of medical microbiology and critical to the treatment of infectious diseases. The reporting of such tests in a uniformly structured and coded manner allows EHR systems to assist in the selection or assessment of antibiotic therapies, thereby promoting effective care and patient safety. This Standard, therefore, prescribes that such tests be reported as described below.

Defining Antimicrobial Sensitivities

For purposes of *this* Standard, an antimicrobial sensitivity test is any test that assesses the susceptibility of a microorganism previously identified via culture to one or more specific antibiotic medications. The results of such a test may indicate, for example, that the microorganism is "susceptible," "moderately susceptible," or "resistant" to a specific antibiotic. For any antimicrobial sensitivity tests, *this Standard* requires that the results be reported according to the Standard below.

(Approved)

OBX Example 5 – Free-text based microbiology (sensitivity) laboratory result example

OBR|1|ORD885-04A3X[1]|05D0642827[2]|6402^Bacterial Susc Panel Islt^L|||20070114||||G|||||
123456789^Good^Robert^^^^^^^^^^NPI||||||200701181430-0800|||F|
11475-1&MICROORGANISM IDENTIFIED&LN&783&CultOrg&L^2^
Beta hemolytic Streptococcus A[3]|||ORD885-04A3X[4] <cr>
OBX|1|NM|*6262^ Ampicllin^L^*28-1^Ampicillin^LN[5]|1|32|ug/mL||S[6]|||F|…<cr>
ZUH|1|18725-2^Microbiology Tests^LN

Superscript 1: OBX-3 Observation Identifier
Superscript 2: OBX-4 Observation Sub-ID
Superscript 3: OBX-5 Observation Value
Superscript 4: OBR-29 Parent
Superscript 5: OBX-4 Observation ID
Superscript 6: OBX-8 Abnormal Flags

(Approved)

OBX Example 6- Discrete Sensitivity

OBR|1|ORD885-04A3X[1]|5788475-04333^^05D0642827^L[2]|6402^Bacterial Susc Panel Islt^L|||20070114||||G||||| 123456789^Good^Robert^^^^^^^^^NPI||||||200701181430-0800|||F|
11475-1&MICROORGANISM IDENTIFIED&LN&783&CultOrg&L^2^
Beta hemolytic Streptococcus A[3]
|||ORD885-04A3X[4]
OBX|1|NM|*6262^ Ampicllin^L^*28-1^Ampicillin^LN[5]|1|32|ug/mL||S[6]|||F|…<cr>
ZUH|1|18725-2^Microbiology Tests^LN

Superscript 1: OBR-2 Placer Order Number
Superscript 2: OBR-3 Filler Order Number
Superscript 3: OBR-26 Parent Result
Superscript 4: OBR-29 Parent
Superscript 5: OBX-4 Observation ID
Superscript 6: OBX-8 Abnormal Flags

(Approved)

OBR-2 Placer Order Number (For free-text and discrete antimicrobial laboratory results)

The Placer Order Number in the sensitivity results must be the same as in the OBR of the culture result that spawned the sensitivity testing. Note that the Placer Order Number is the same for all of the OBR segments in the example, although the sensitivity results are "reflex tests" that were not explicitly ordered by the ordering provider.

OBR-3 Filler Order Number (For free-text and discrete antimicrobial laboratory results)

The Filler Order Number is the unique lab-assigned identifier for the test. Note that the Filler order numbers for the susceptibility panels (sensitivity tests) may be different than the Filler Order Number of the culture that spawned the sensitivity testing, because many labs consider reflex tests as separate "internal" orders. In other cases, the Filler order numbers for the susceptibility panels may be the same as the Filler Order Number of the culture that spawned the sensitivity testing, because certain labs populate the Filler Order Number with their specimen identifier.

OBR-26 Parent Results (For free-text and discrete antimicrobial laboratory results)

Condition: OBR-26 Parent Result must be populated if the value of OBR-11 Specimen Action Code is **G** ("Generated order; reflex order"). In these cases, the value of OBR-11 allows the receiving system to correctly associate the results of a reflex test (for example, the antibiotic susceptibilities of an organism) to the previous culture result (i.e., the identity of the organism). When the value of OBR-11 Specimen Action Code is NOT **G**, the usage of OBR-26 is not supported (i.e., the field should not be populated).

When populated, the value of OBR-26 must reference the OBX segment of the test result that prompted the reflex test.

For tests other than reflex tests, OBR-26 is not supported. Receiving systems should expect this field to not be populated by conformant sending systems (except for reflex tests), and sending systems should not populate this field.

In the OBR segment of a sensitivity result, the value of the Parent Result field references the OBX segment for the identified organism that prompted the sensitivity testing. For example, the value in the Parent Result field of the first sensitivity result above is

783&CultOrg&L&11475-1&MICROORGANISM IDENTIFIED&LN^1^Staphylococcus aureus

which references the Observation ID (OBX-3), Observation Sub-ID (OBX-4), and the text component of the Observation Value (OBX-5.2 *or OBX-5.5*) of the first OBX segment in the culture result. Note the following correspondence between the components and sub-components of OBR-26 Parent Result field in the sensitivity result and the fields and components of the corresponding OBX segment in the culture result:

(Approved)

Field: OBR-26 Parent Result (Sensitivity Result)

Component/Sub-Component in OBR-26	Usage	Referenced Field/Component in Parent OBX Segment
OBR-26.1 (1st component)	*C*	*Required if OBR-11 (Specimen Action Code) = G (generated order; reflex order);* *Otherwise this field should not be populated.*
OBR-26.1.1 (1st sub-component)	*O*	OBX-3.1 Observation Identifier.Identifier *Recommended use if available. Agreed upon by trading partners*
OBR-26.1.2 (2nd sub-component)	*R*	OBX-3.2 Observation Identifier.Text *Agreed upon by trading partners*
OBR-26.1.3 (3rd sub-component)	*R*	OBX-3.3 Observation Identifier.Name of Coding System *Use L = local for local field*
OBR-26.1.4 (4th sub-component)	*O*	OBX-3.*4* Observation Identifier.Alt Identifier *Recommended use of LOINC identifiers, see appendix C for guidance.*
OBR-26.1.5 (5th sub-component)	*O*	OBX-3.*5* Observation Identifier.Alt Text *Recommended use of LOINC identifiers, see appendix C for guidance.*
OBR-26.1.6 (6th sub-component)	*O*	OBX-3.*6* Observation Identifier.Name of Alt Coding System *Alternative coding system LOINC, use "LN".*
OBR-26.2 (2nd component)	*R*	OBX-4 Observation Sub-ID *Required when reporting microbiology (antimicrobial sensitivites) reports.*
OBR-26.3 (3rd component)	R	OBX-5.2 (if local codes are exclusively used) or OBX-5.5 (if SNOMED-CT codes are exclusively used). If local and SNOMED-CT codes are both used, OBX-5.5 (SNOMED-CT codes) should populate this field. Observation Value.Text *Required when reporting microbiology antimicrobial sensitivites reports.*

Note: Because organisms identified in culture results must be reported as coded entities (see OBX-3 in this appendix), one can safely assume that OBX-5.2 *or OBX-5.5* (see above table) of the parent result will be the text representation of a coded entity.

(Approved)

OBR-29 Parent (For free-text and discrete antimicrobial laboratory results)

OBR-29 references the values of the Placer Order Number (OBR-2) and the Filler Order Number (OBR-3) in the OBR segment of the culture result that spawned the sensitivity testing. OBR-29 must be populated when reporting the result of any reflex test, including an antimicrobial susceptibility. The individual components of OBR-29 that must be populated.

In the example of Discrete Sensitivity Results 1 and 2, the value of OBR-29 for both sensitivity results is

*Q55555555^9999^ &&0506DE188424^9999^*

which reflects the values of OBR-2 and OBR-3 in the preceding culture result:

OBR-2: *Q55555555^9999*

OBR-3: *0506DE188424^9999*

Referencing the OBR-2 and OBR-3 values of the "parent" culture allows a receiving system to uniquely associate sensitivity results with the culture results that generated them. Note: Such unique association also requires use of OBR-26.

OBX-5 Observation Value (For free-text and discrete antimicrobial laboratory results)

For sensitivity results, the Observation Value field may be represented in whatever manner suits the laboratory and is consistent with conventional practice. The uniform coding of the Abnormal Flags field (see below) is more important for the automated processing of sensitivity results.

OBX-6 Units (For free-text and discrete antimicrobial laboratory results)

When applicable, the Units field should be represented.

OBX-8 Abnormal Flags (For discrete antimicrobial laboratory results)

For sensitivity results, the value of the Abnormal Flags field must be one of the following values from *HL7* table 0078 *in table 16*

Value	Description
S	Susceptible. Indicates for microbiology susceptibilities only.
R	Resistant. Indicates for microbiology susceptibilities only.
I	Intermediate. Indicates for microbiology susceptibilities only.
MS	Moderately susceptible. Indicates for microbiology susceptibilities only.
VS	Very susceptible. Indicates for microbiology susceptibilities only.